APPENDIX G
FUEL MODELS

Fuel Model descriptions taken from Aids to Determining Fuel Models for Estimating Fire Behavior by Hal E. Anderson, 1982.

FUEL MODEL 1:

Fire spread is governed by the fine herbaceous fuels that have cured or are nearly cured. Fires move rapidly through cured grass and associated material. Very little shrub or timber is present, generally less than one-third of the area.

FUEL MODEL 2:

Fire spread is primarily through the fine herbaceous fuels, either curing or dead. These are surface fires where the herbaceous materials, besides litter and dead-down stemwood from the open shrub or timber overstory, contribute to the fire intensity. Open shrub lands and pine stands that cover one-third or two-thirds of the area may generally fit this model, but may include clumps of fuels that generate higher intensities and produce firebrands.

FUEL MODEL 3:

Fires in this fuel are the most intense of the grass group and display high rates of spread under the influence of wind. The fire may be driven into the upper heights of the grass stand by the wind and cross standing water. Stands are tall, averaging about 3 ft., but may vary considerably. Approximately one-third or more of the stand is considered dead or cured, and maintains the fire.

Fuel Model 4:

Fire intensity and fast-spreading fires involve the foliage and live and dead fine woody material in the crowns of a nearly continuous overstory. Stands of mature shrubs, 6 or more feet tall, such as California mixed chaparral, the high pocosin along the east coast, the pinebarrens of New Jersey, or the closed jack pine stands of the north-central States are typical candidates. Besides flammable foliage, dead woody material in the stands significantly contributes to the fire intensity.

FUEL MODEL 5:

Fire is generally carried in the surface fuels that are made up of litter cast by the shrubs, and the grasses or forbs in the understory. The fires are generally not very intense because surface fuel loads are light, the shrubs are young with little dead material, and the foliage contains little volatile material. Shrubs are generally not tall, but have nearly total coverage of the area.

FUEL MODEL 8:

Slow-burning ground fires with low flame heights are the rule, although the fire may encounter an occasional “jackpot” or heavy fuel concentration that can flare up. Only under severe weather conditions involving high temperatures, low humidities, and high winds do the fuels pose fire hazards. Closed canopy stands of short-needle conifers or hardwoods that have leafed out support fire in the compact litter layer. This layer is mainly needles, leaves, and some twigs since little undergrowth is present in the stand.

FUEL MODEL 10:

The fires burn in the surface and ground fuels with greater fire intensity than the other timber litter models. Dead down fuels include greater quantities of 3-inch or larger limbwood resulting from overmaturity or natural events that create a large load of dead materiel on the forest floor.

Crowning out, spotting, and torching of individual trees is more frequent in this fuel situation, leading to potential fire control difficulties. Any forest type may be considered if heavy down material is present; for example insect or disease ridden stands, wind-thrown stands, overmature stands with deadfall, and aged slash from light thinning or partial cutting.

FUEL MODEL 13:

Fire is generally carried across the area by a continuous layer of slash. Large quantities of greater than 3-inch material are present. Fires spread quickly through the fine fuels and intensity builds up more slowly as the large fuels start burning. Active flaming is sustained for long periods and firebrands of various sizes may be generated. These contribute to spotting problems as the weather conditions become more severe